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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,085	08/01/2003	Rajasingh Israel	LDHQ10695-3 (GECZ 2 00083	3209
7590 Timothy E. Nauman FAY, SHARPF, FAGAN, MINNICH & McKEE, LLP 1100 Superior Avenue Cleveland, OH 44114				
EXAMINER HINES, ANNE M				
ART UNIT 2879		PAPER NUMBER		
MAIL DATE 05/28/2008		DELIVERY MODE PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/633,085

**Applicant(s)**

ISRAEL ET AL.

**Examiner**

ANNE M. HINES

**Art Unit**

2879

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 and 20-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 20-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

The amendment filed on January 23, 2008, has been entered and acknowledged by the Examiner.

Claims 1-14, 20-25 are pending in the instant application.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically in claim 12, the requirement that the protective layer has an optical thickness ( $t_{opt}$ ) that satisfies the relationship:  $1.1(1 + 0.9n) \leq t_{opt} \leq 1.4(1 + 0.9n)$  where  $n$  is an integer from 0 to 5, is indefinite because the units on each side of the inequality do not agree with each other; the specification defines  $t_{opt}$  as the product of a layer's physical thickness and its refractive index, with units of Angstroms, the values calculated for the left and right side of the inequality are unitless, since  $n$  is a unitless integer. Furthermore, upon calculating the upper and lower bounds for the inequality it becomes evident that there are no layer thickness for the protective layer disclosed by Applicant that fall within the ranges claimed by claim 12 as it is currently written. For example, when  $n=0$ , the lower and upper bounds are 1.1 and 1.4, respectively. Upon

reading Applicant's disclosure it appears that the lower and upper bound calculations are intended to be multiplied against the quarterwave length of various wavelengths of visible light (See for example the disclosure at paragraphs [00056]-[00060] and Figure 5). The Examiner has treated the claim on its merits assuming this correction. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14 and 20-25 rejected under 35 U.S.C. 103(a) as being unpatentable over Arsenault et al. (US 4,959,583) in view of Adams (US 3,687,713).

Regarding claims 1 and 23, Arsenault teaches a lamp including a reflective interior surface with a layer of silver as the reflective material (Fig. 1; Column 2, lines 60-66), but fails to teach a protective layer for the silver layer.

In the same field of endeavor of silver reflective layers, Adams teaches wherein a silver reflective layer has a protective layer formed over it (Column 1, lines 15-20; Column 4, lines 19-65) in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance (Column 2, lines 15-26) such that a % reflectance of the reflective interior surface is no more than about 3% less than that of an equivalent reflective interior surface without the

protective layer in a visible spectral range of 400-800 nm (Fig. 5, compare line for 'unprotected silver; with line for 'protected silver with enhancement').

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Arsena to have the silver reflective layer protected such that % reflectance of the reflective interior surface is no more than about 3% less than that of an equivalent reflective interior surface without the protective layer in a visible spectral range of 400-800 nm in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance.

Regarding claims 2-3 and 21-22, Adams further teaches wherein the thickness of the protective layer formed on a silver reflective layer is silica with a thickness from 1000-1100 Angstroms (Column 4, lines 59-61), which is a structure that characteristically meets the claimed requirement of a color correction temperature of the lamp being no more than 20K less than a color correction temperature of the light source (Applicant's disclosure Paragraph [00044]). Motivation to combine is the same as for claim 1.

Regarding claims 4 and 24, Arsena teaches a lamp including a reflective interior surface with a layer of silver as the reflective material (Fig. 1; Column 2, lines 60-66), but fails to teach a protective layer for the silver layer.

In the same field of endeavor of silver reflective layers, Adams teaches wherein a silver reflective layer has a protective layer formed over it (Column 1, lines 15-20;

Art Unit: 2879

Column 4, lines 19-65) in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance (Column 2, lines 15-26) wherein the thickness of the protective layer formed on a silver reflective layer of silica is such that the required characteristicly meets the claimed requirement of a color correction temperature of the lamp being greater than a color correction temperature of the light source (Column 4, lines 59-61; Column 5, line 73 to Column 6, line 8).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Arsena to have the silver reflective layer of Adams such that the required characteristicly meets the claimed requirement of a color correction temperature of the lamp being greater than a color correction temperature of the light source in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance.

Regarding claim 5, Adams further teaches wherein the reflectance of the reflective interior is at least 94.5% in the visible spectrum range of 400-800 nm (Fig. 5). Motivation to combine is the same as for claim 1.

Regarding claim 6, Adams further teaches wherein the % reflectance of the reflective interior surface is no more than about 2.5% less than that of the layer of a reflective material in the visible spectral range of 400-800nm (Fig. 5). Motivation to combine is the same as for claim 1.

Regarding claim 7, Arsena further discloses wherein the reflective layer is silver, which characteristically has an average % reflectance of at least 90% in the visible range of the spectrum (Column 2, lines 60-67).

Regarding claim 8, Arsena further discloses wherein the reflective layer is silver (Column 2, lines 60-67).

Regarding claims 9-11, Adams further teaches wherein the protective layer comprises silicon dioxide with a thickness of 1000 to 1100 Angstroms (Column 4, lines 59-61). Motivation to combine is the same as for claim 1.

Regarding claims 12 and 25, Arsena teaches a lamp including a reflective interior surface with a layer of silver as the reflective material (Fig. 1; Column 2, lines 60-66), but fails to teach a protective layer for the silver layer.

In the same field of endeavor of silver reflective layers, Adams teaches wherein a silver reflective layer has a protective layer formed over it (Column 1, lines 15-20; Column 4, lines 19-65) in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance (Column 2, lines 15-26) such that a % reflectance of the reflective interior surface is no more than about 3% less than that of an equivalent reflective interior surface without the protective layer in a visible spectral range of 400-800 nm (Fig. 5, compare line for 'unprotected silver; with line for 'protected silver with enhancement') and wherein the protective layer comprises silicon dioxide with a thickness of 1000 to 1100 Angstroms (Column 4, lines 59-61).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Arsena to have the silver reflective layer protected such that % reflectance of the reflective interior surface is no more than about 3% less than that of an equivalent reflective interior surface without the protective layer in a visible spectral range of 400-800 nm in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance.

Note that for a silica layer (Refractive index = 1.46) with a physical thickness of 1000 Angstroms, the optical thickness is 1460, which is within the upper and lower limits when  $n=0$  for a light wavelength of 450 nm (4500 Angstroms); the lower limit being:  $0.25 * 4500 \text{ Ang} * 1.1 = 1237.5 \text{ Angstroms}$  and the upper limit being  $0.25 * 4500 \text{ Ang} * 1.4 = 1575 \text{ Angstroms}$ .

Regarding claim 13, Arsena further discloses a tabulation step where the reflective layer is formed after the tabulation step (Column 2, line 60 to Column 3, line 9).

Regarding claim 14, Adams teaches depositing the silicon dioxide layer by physical vapor deposition (Column 4, lines 19-56), but fails to teach wherein it can be deposited by chemical vapor deposition. However, it is well known in the art to deposit silicon dioxide layers by either physical vapor deposition or chemical vapor deposition in order to provide the layer through a method that allows for accurate control of the thickness. Therefore, it would have been obvious to one of ordinary skill in the art to have the silicon dioxide layer of Adams deposited through chemical vapor deposition



rather than physical vapor deposition since both methods are well known methods for forming a layer with a precise thickness.

Regarding claim 20, Arsena teaches a lamp including a reflective interior surface with a layer of silver as the reflective material (Fig. 1; Column 2, lines 60-66), but fails to teach a protective layer for the silver layer.

In the same field of endeavor of silver reflective layers, Adams teaches wherein a silver reflective layer has a protective layer formed over it (Column 1, lines 15-20; Column 4, lines 19-65) in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance (Column 2, lines 15-26) such that a % reflectance of the reflective interior surface is no more than about 3% less than that of an equivalent reflective interior surface without the protective layer in a visible spectral range of 400-800 nm (Fig. 5, compare line for 'unprotected silver; with line for 'protected silver with enhancement'), and wherein the thickness of the protective layer formed on a silver reflective layer is silica with a thickness from 1000-1100 Angstroms (Column 4, lines 59-61), which is a structure that characteristically meets the claimed requirement of a color correction temperature of the lamp being no more than 20K less than a color correction temperature of the light source (Applicant's disclosure Paragraph [00044]).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Arsena to have the silver reflective layer protected such that % reflectance of the reflective interior surface is no more than about 3% less than that of

an equivalent reflective interior surface without the protective layer in a visible spectral range of 400-800 nm and wherein the thickness of the protective layer results in a color correction temperature of the lamp being no more than 20K less than a color correction temperature of the light source in order to protect the silver reflective layer from sulfides in the atmosphere from tarnishing the layer and diminishing the visible light reflectance.

Note, the Examiner considers that Adams disclosure of choosing the protective layer thickness based upon the quarterwave length of the least reflected light wavelength to meet the requirement of determining an oscillating function when percent reflectance is plotted against optical thickness since using a material thickness that is a quarter of the desired transmitted wavelength corresponds to the first peak in an oscillating reflectance curve plotted against thickness for a given wavelength of light.

### ***Response to Arguments***

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached on Monday through Friday from 8:00-4:30.

Art Unit: 2879

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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